

A Field Test of the Impact of an Inservice Training Program on Health Sciences Education Faculty

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Abstract

The goal of the Health Sciences Faculty Education Project at Oregon Health & Science University was to enhance the capacity of health science programs and faculty to admit, teach, accommodate, and graduate students with disabilities. Multiple approaches were implemented to achieve this goal. A key strategy was an inservice training program designed specifically for health sciences education faculty called "A Day in the Life of Health Science Students." The program was field-tested with 247 nursing, medicine, dentistry, and allied health faculty at 39 institutions. Participating in the training positively impacted the perceptions, knowledge, and concerns of the faculty about students with disabilities. "A Day in the Life of Health Science Students" is an important tool available to health sciences education programs as the number of students with disabilities who wish to enter these programs continues to grow.

The health science field offers excellent career opportunities for individuals with disabilities. The Bureau of Labor Statistics projects that of the 25 fastest growing occupations during 2000-2010, 13 are in the medical and health fields. In addition, 11 of the 25 highest paying occupations are in these fields (CAREERINFONET webpage, June 15, 2003). To ensure that individuals with disabilities have equal opportunities to receive the education they will need to enter these careers, health sciences education programs and faculty must have the capacity to admit and retain students with disabilities.

The authors conducted a review of the literature related to health sciences education and students with disabilities (Health Science Faculty Education website, June 15, 2003; Sowers & Smith, in press-a). The vast majority of the articles appeared in medicine and nursing journals. To date, no comprehensive studies have been conducted to obtain an estimate of the number of students with disabilities who enroll in health sciences education programs in general. In one study, Wu, Tsang, and Wainapel (1996) surveyed medical schools between 1987 and 1990 to determine the

number of graduates who experience a physical disability. Only 2 % of graduates experienced a physical disability and few of these students experienced a severe disability. However, preliminary evidence suggests that students with disabilities are seeking admission to medical schools in increasing numbers. For example, requests for accommodations when taking the Medical College Admissions Test (MCAT) grew from 69 in 1985 to 101 in 1990, and to 330 in 1993 (Keyes, 1993).

In nursing, Magilvy and Mitchell (1995) surveyed 86 programs and found that almost 80% reported that they had admitted a student with a disability in the prior five years. The number of students with disabilities admitted to the programs ranged from 1 to 200, with an average of 13. Watson (1995) found that 45% of the 247 nursing programs that returned his survey indicated that they had admitted new students with disabilities for that academic year. The most prevalent disability was learning, followed by physical/mobility, hearing, visual, and psychological. No studies have been conducted to estimate the number of students with disabilities in dental or allied health programs.

Many health sciences education faculty believe that students with disabilities may not be appropriate candidates for their programs (Christensen, 1998; Martini, 1987; Swenson, Foster, & Champagne, 1991; Takakuwa, 1998; Weatherby & Moran, 1989). Among medicine and nursing faculty, the most consistent and important concern regarding students with disabilities is the ability of these students to provide safe patient care in clinical training settings (Marks, 1999; Reichgott, 1998). A number of other concerns were also identified in the literature, including the impact of students with disabilities on the academic and clinical standards of programs, the amount of faculty time necessary to accommodate students, and the attitude and reaction of other students toward students who are accommodated because of their disability (Hartman & Hartman, 1981; Maheady, 1999). The medicine and nursing literature also points to the need for training aimed at increasing the knowledge of faculty in order to enhance their attitudes toward and to alleviate their concerns about students with disabilities (Helms & Weiler, 1991; Magilvy & Mitchell, 1995; Maheady, 1999; Takakuwa, 1998; Thompson, 1995; Watson, 1995).

The authors conducted a survey of 966 health sciences education faculty at 39 institutions regarding their perceptions, concerns, and knowledge about students with disabilities (Sowers & Smith, in preparation). The primary purpose of the survey was to obtain information that would serve as the basis for the content of a faculty inservice training program. Participants first answered a number of demographic questions, including their title, department, length of time teaching, and experience with students and others with disabilities. Faculty then rated their perceptions of the ability of students with different disabilities (e.g., learning, mental health) to successfully complete their program, their concerns about various issues (e.g., patient safety, cost of accommodations), and their need for training related to a variety of topics (e.g., legal requirements, accommodation strategies).

The results of the survey showed that faculty perceptions about the capacity of students with disabilities to be successful in their programs were low (Sowers & Smith, in press-b; Sowers & Smith, in preparation). Responses also substantiated previously

voiced concerns that faculty were worried about patient safety, cost of accommodations, need to lower the standards of their academic and clinical program, and the reaction of other students toward students with disabilities who were accommodated. Finally, faculty noted that they needed and wanted training about these issues. This article presents the results of a field test of "A Day in the Life Health Science Students" inservice training curriculum. The curriculum was developed and field-tested through the Health Sciences Faculty Education Project. Prior to the inservice training field-test methods and results, we will provide a brief description of the project.

Health Sciences Faculty Education Project

The Health Sciences Faculty Education Project developed, implemented, and evaluated several approaches to enhancing the capacity of health sciences programs and faculty to teach and accommodate students with disabilities. The Oregon Health & Sciences University (OHSU) and Portland Community College were the key implementation sites. Project staff worked with the administration at the institutional and program levels (e.g., School of Medicine, Department of Nursing) to develop policies and practices that would enhance the admission and retention of students with disabilities.

A key practice was the implementation a Program Accommodation Liaison (PAL) model, through which an administrator or faculty in each health science program takes a key leadership role in developing their program's capacity regarding students with disabilities. In part, the PAL model was based on the results of a study conducted by HEATH Resource Center, the Association on Higher Education And Disability (AHEAD), and the Educational Testing Service (ETS), to examine postsecondary education for students with disabilities model projects funded by OSERS (Samberg, 1994). The study identified strategies used by the projects to impact faculty, the relative effectiveness of these strategies, and the challenges encountered by the projects. Inservice training and consultation delivered by the project staff or disabled student service (DSS) staff members were found to be common strategies. The projects reported significant difficulty getting faculty and staff to attend training events. While most project directors sug-

gested that consultation was generally well received by faculty, many reported encountering resistance. Project and DSS staff felt that the resistance partly derived from a feeling on the part of the faculty that the staff did not have sufficient knowledge of the faculty's subject matter to be credible. The PAL model addresses this barrier by training department faculty and administrators who are knowledgeable about the curriculum and profession, who can then assist DSS staff in providing training and technical assistance to other faculty. Administrators and faculty volunteered to be a PAL based on their interest to serve in this role for their programs and their willingness to attend trainings and participate in technical assistance. The PALs attended a two-day inservice training program at the beginning of the project. The training included in-depth information about the history of the disabilities rights movement, postsecondary data related to students with disabilities and services, legal issues and trends in general and specific to health sciences education, accommodation strategies in general and specific to health sciences education programs and students, and universal teaching strategies. Each PAL developed a plan that included action steps for how they would bring information to the faculty in their programs and for developing policies, procedures, and practices that would enhance the extent to which their program was welcoming of and accessible to students with disabilities. Project staff met with each PAL, at least monthly to provide them with technical assistance related to achieving their goals and completing their action steps. For example, we worked with PALs to develop orientation and other program materials that communicated the program's commitment to welcoming, accommodating, and supporting students with disabilities.

Another key approach was the "A Day in the Life of Health Science Students" inservice training curriculum to be described in detail in the methods section of this article. A train-the-trainer guide was developed to enable staff in offices for students with disabilities to deliver the inservice training program to faculty at their institutions. The guide includes the overheads from the inservice training program, presenter notes for each overhead, and hints for how to deliver the information and engage faculty. It has been field-tested with faculty at the project's outreach in-

stitutions (i.e., institutions where faculty received the inservice training).

A project web site (www.healthsciencefaculty.org) was another major component of the project. This web site is specifically targeted to health science faculty. Using Universal Design principles as a framework, we included topics in which health sciences faculty are interested and then discussed how these topics apply to students with disabilities (Center for Universal Design, 2002). For example, in the Technology for Everyone section, one article described robotic surgery and the implications of this technology for medical students with disabilities (e.g., someone with limited hand use might be able to do surgery with this technology). When new information was posted on the web site, each of the faculty at the key implementation and outreach sites received an email from their PAL and/or office for students with disabilities about the information and a link to the site.

In the remainder of this article, we will present the methodology and the results of the field-test of the "A Day in the Life of Health Science Students" inservice training program. The purpose of the field test was to evaluate the impact of the inservice training program on the perceptions, concerns, and knowledge of health sciences education faculty about students with disabilities.

Field-Test Methods

Participants

A total of 247 faculty at 39 institutions participated in "A Day in the Life of a Health Science Student" inservice training program. Fifty-one medicine, 112 nursing, 53 dental (dentistry, dental hygiene, and dental assistants), and 31 allied health faculty members attended the training and completed at least one question on the evaluation form. Allied health faculty included a broad range of career program areas, such as clinical lab sciences, radiology, emergency medical technicians, and dietetics. The participants included full, associate, and assistant professors, as well as instructors. Some faculty and instructors worked part time, and some primarily taught in clinical settings off campus.

“A Day in the Life of Health Science Students” Inservice Training Curriculum

We used the results of our survey, along with a review of the literature, and input from faculty and staff in the office for students with disabilities services at a number of institutions with health sciences programs to develop training curriculum for faculty. “A Day in the Life of Health Science Students”, has four key goals.

The first goal is to enhance the perception of faculty regarding the capacity of students with disabilities to successfully complete their programs and to be successful health science professionals. Videotapes of individuals with various disabilities who have completed health science training and are successful professionals are a key element of the training. These professionals describe their experiences getting into and completing their education, as well as their experiences as professionals. They also describe accommodations that they had used in their programs and now use in their professions, specifically addressing the concerns of health sciences education faculty.

The second goal of the training curriculum is to provide specific information and strategies about how health science students with various disabilities can be successfully supervised, taught, and accommodated in clinical settings. To that end, the key academic and clinical activities that students are required to learn and perform are used to illustrate how students with a variety of disabilities can be taught and accommodated. A key theme of the curriculum is the advantage of using Universal Design strategies. Information about specific disabilities, such as learning disabilities are discussed and illustrated in the context of the type of teaching strategies and accommodations that could be used for each of the tasks or skills (e.g., reading patient charts) that students learn to perform. The inservice training materials include examples of tasks and accommodations that are specifically targeted to each of the major health sciences education programs (e.g., nursing, medicine, dentistry, and a number of the allied health programs).

The third goal of the inservice training is to help faculty understand that Section 504 of the Rehabilitation Act of 1973 (P.L. 93-122) and the Americans with Disabilities Act (ADA) (P.L. 101-336) are not affirmative action laws or require that academic and clinical standards be modified or lowered to accom-

modate students with disabilities. The key features of the laws (e.g., otherwise qualified student) are covered and discussed in the context of health science programs, including clinical settings.

The fourth goal of the inservice training curriculum is to provide information to faculty to address their concerns about including students with disabilities in their health science programs. For example, data are presented about the low cost of the majority of accommodations. Significant attention is paid in the curriculum to addressing faculty concerns about patient care and safety.

“A Day in the Life of Health Science Students” inservice training curriculum is approximately two hours long. This includes presentation of information, exercises (e.g., problem solving accommodations strategies related to specific functional difficulties that a student might have in performing a task), and questions and answers. The training time can easily be shortened or lengthened by the number of exercises that are included.

Measures

At the conclusion of the training, faculty completed a questionnaire to assess the impact of the training on their perceptions, knowledge, and concerns. They were asked to rate the extent to which they agreed with the statement: “Students who experience the following types of disabilities can be successful in my program and profession”: (a) significant learning disabilities, (b) blind or have significant vision loss, (c) deaf or have significant hearing loss, (d) use a wheelchair, and (e) significant mental health disabilities. They rated the extent to which they agreed with the statement prior to and after the training, using a 6-point Likert scale, with 6 = Strong Agreement and 1 = Strong Disagreement.

The faculty members were also asked to rate the extent to which they had concerns regarding students with disabilities being in their programs. Specifically, they were asked to rate their concerns about the following issues: (a) cost, (b) time required of faculty, (c) impact on academic standards, (d) impact on clinical standards, (e) impact on patient care, and (f) perceptions of other students about students with disabilities and the accommodations they received. They rated their concerns using a 6-point Likert scale, with 6 = Very Concerned and 1 = Not Concerned.

Faculty were also asked to rate the extent to which their knowledge was increased as a result of participating in the training about the intent and implications of the disability laws for health science programs and faculty related to students with disabilities, how to teach these students in classroom and in clinical settings, and about accommodation strategies.

Faculty rated their knowledge increase from A Great Deal (6) to Not at All (1).

Finally, faculty were asked to rate the extent to which they agreed that the topics covered met their need, that they would use the information, and that the format was conducive to learning the information.

Table 1

Mean, Standard Deviations, and T-Tests Pre- And Post-Training for Faculty Perceptions of Student Ability to Succeed in Their Programs

Disabilities	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Paired Differ. Mean	Paired Differ. SD	T (2-tailed)
<i>Medicine</i>								
LD	41	4.15	1.24	4.54	1.19	.390	.628	3.981**
Blind	40	3.40	1.43	4.10	1.34	.700	1.09	4.059**
Deaf	41	4.56	1.12	4.95	1.05	.390	.771	3.242*
Wheelchair User	41	5.44	.81	5.59	.71	.146	.358	2.619
Mental Health	40	3.44	1.30	3.79	1.31	.350	.700	3.163*
<i>Nursing</i>								
LD	89	3.54	1.11	4.40	1.10	.860	1.08	7.805**
Blind	91	2.62	1.21	3.36	1.47	.736	1.08	6.482**
Deaf	88	3.59	1.34	4.36	1.24	.773	1.09	6.664**
Wheelchair User	90	3.53	1.56	4.11	1.52	.583	.910	6.084**
Mental Health	89	2.99	1.25	3.45	1.35	.455	.804	5.343**

Table 1 (*continued*)

Disabilities	N	Pre Mean	Pre SD	Post Mean	Post SD	Paired Differ. Mean	Paired Differ. SD	T (2- tailed)
<i>Dentistry</i>								
LD	49	3.68	1.25	4.49	1.08	.806	.983	5.739**
Blind	47	1.74	1.26	1.87	1.38	.128	.400	2.207
Deaf	48	4.23	1.24	4.51	1.23	.281	.831	2.345
Wheelchair User	51	4.75	1.39	5.17	1.33	.412	.920	3.195*
Mental Health	45	2.98	1.39	3.19	1.39	.211	.644	2.199
<i>Allied Health</i>								
LD	18	3.33	1.24	4.22	1.00	.889	.900	4.189**
Blind	19	2.32	1.42	3.00	1.83	.684	.820	3.637*
Deaf	18	3.72	1.90	4.50	1.76	.778	1.00	3.289*
Wheelchair User	18	4.33	1.68	5.06	1.76	.722	1.02	3.010*
Mental Health	18	2.5	1.07	3.11	1.37	.611	.778	3.335*

Note. Rating scale: 6= Strong Agreement; 1=Strong Disagreement.

* $p < .010$. ** $p < .001$ to .010.

Faculty rated their agreement for each of these three questions from Strong Agreement (6) to Strong Disagreement (1).

Results

The number of faculty who responded to each of the questions on the post-training questionnaire varied dramatically. In part this occurred because

Table 2

Mean, Standard Deviations, and T-Tests Pre- And Post-Training for Faculty Concerns about Having Students in Their Programs

Concerns	N	Pre-Mean	Pre-SD	Post-Mean	Post-SD	Paired Differ. Mean	Paired Differ. SD	T (2-tailed)
<i>Medicine</i>								
Cost of Accom.	42	3.45	1.66	3.38	1.65	-.071	.463	-1.00
Time by Staff	43	4.21	1.26	4.16	1.31	-.047	.486	-.63
Impact on Academic Standards	43	3.51	1.53	3.47	1.49	-.047	.532	-.57
Impact on Clinical Standards	43	3.72	1.44	3.67	1.41	-.047	.486	-.63
Impact on Patient Care	43	3.86	1.44	3.77	1.44	-.093	.479	-1.27
Perceptions of Other Students	22	2.36	1.22	2.41	1.30	.045	.375	.57

some faculty chose not to answer the questions related to their perceptions and concerns, but were willing to answer the questions about the impact of the training on their knowledge and to give general feedback about the training. Some faculty were willing to answer a few of the questions about perceptions and concerns, but not others. The number of faculty who responded to the concern related to the “perception of other students” was particularly low because the page on which this question appeared was inadvertently not included in the questionnaire for a number of the training events. In the following, we present the major findings grouped into four categories.

Perceived Ability of Students with Disabilities to Be Successful in Health Science Program and Professions

Table 1 shows the means and standard deviations of the ratings by faculty of their perceptions of the ability of students with disabilities to be successful in their programs, prior to and after participating in the inservice training. As illustrated, the perceptions of the medicine faculty increased for each of the five disability groups, with increases ranging from .700 for students who are blind to .146 for wheelchair users. The change in ratings for the medicine faculty

Table 2 (*continued*)

Concerns	N	Pre Mean	Pre SD	Post Mean	Post SD	Paired Differ. Mean	Paired Differ. SD	T (2- tailed)
<i>Nursing</i>								
Cost of Accom.	89	3.54	1.50	3.40	1.58	-.140	1.21	-1.097
Time by Staff	91	4.36	1.34	3.95	1.46	-.418	1.17	-3.420**
Impact on Academic Standards	90	4.11	1.38	3.52	1.49	-.589	1.18	-4.737**
Impact on Clinical Standards	91	4.46	1.37	3.73	1.41	-.731	1.26	-5.557**
Impact on Patient Care	90	4.52	1.36	3.84	1.48	-.678	1.24	-5.208**
Perceptions of Other Students	14	3.50	1.56	3.14	1.46	-.357	.929	-1.439

was statistically significant ($p < .001$) for students with learning disabilities and students who are blind. Further, the rating changes for students who are deaf and who have mental health disabilities, while not statistically significant, can be considered to be strong evidence of the impact of the inservice training.

Increases in the perceptions of nursing faculty occurred for each of the disability groups, with the greatest change for students with learning disabilities (.860) and the least for students with mental health disabilities (.455). The changes in nursing faculty perceptions for each of the disabilities groups were statistically significant at the .001 level.

The dental faculty perceptions also increased for each of the disability groups, with the least change for students who are blind (.128) and the greatest for students who have a learning disability (.806). However, only the change in the faculty ratings related to students who have a learning disability is considered statistically significant. In addition, while the change related to students who are wheelchair users is not statistically significant, it is considered strong evidence of the impact of the training.

The greatest amount of change for the allied health faculty occurred for students with learning disabilities (.889); the least amount of change occurred for students who experience mental health disabilities

Table 2 (*continued*)

Concerns	N	Pre Mean	Pre SD	Post Mean	Post SD	Paired Differ. Mean	Paired Differ. SD	T (2- tailed)
<i>Dentistry</i>								
Cost of Accom.	50	3.67	1.48	3.23	1.50	-.440	1.30	-2.40
Time by Staff	50	4.55	1.20	3.91	1.38	-.640	1.54	-2.95*
Impact on Academic Standards	49	4.05	1.26	3.38	1.48	-.673	1.61	-2.92*
Impact on Clinical Standards	49	4.44	1.22	3.50	1.23	-.939	1.52	-4.32**
Impact on Patient Care	49	4.60	1.33	3.56	1.45	-1.04	1.49	-4.90**
Perceptions of Other Students	6	4.17	1.17	3.17	1.47	-1.00	1.79	-1.37

(.611). Only the change for students with learning disabilities is considered statistically significant; however, the changes related to students with the other types of disabilities can be considered strong evidence of the impact of participating in the inservice training.

Concerns Related to Students with Disabilities

Table 2 shows the means of the ratings given by the faculty in each of the four disciplines regarding the extent of their concerns about the six issues related to having students with disabilities in their programs, prior to and after participating in the inservice training. Looking across the means of the 24 ratings (i.e., four disciplines times six questions each), 14 of the faculty ratings were 4.0 or above prior to the training. Only

the medicine faculty's ratings of their concerns about "the perception of other students about students with disabilities" were below 3.0.

The greatest amount of post-training change for the medicine faculty was related to patient care concerns (-.07), while their concerns actually increased slightly related to "perception of other students of students with disabilities" (.045). None of the changes were statistically significant or suggested strong evidence for the impact of the inservice training.

The inservice training appeared to have the greatest impact on the concerns of the nursing faculty. Thus, after the training, all of their ratings decreased to below 4.0, and four of the changes (staff time, impact on academic standards, impact on clinical standards,

Table 2 (*continued*)

Concerns	N	Pre Mean	Pre SD	Post Mean	Post SD	Paired Differ. Mean	Paired Differ. SD	T (2- tailed)
<i>Allied Health</i>								
Cost of Accom.	20	3.65	1.73	3.0	1.34	-.650	.988	-2.94*
Time by Staff	21	4.71	1.01	3.57	1.12	-1.14	1.11	-4.72**
Impact on Academic Standards	20	4.50	1.36	3.20	1.20	-1.30	1.17	-4.95*
Impact on Clinical Standards	20	4.65	1.46	3.45	1.32	-1.20	1.11	-4.86**
Impact on Patient Care	21	4.76	1.30	3.95	1.43	-.810	.928	-4.00*
Perceptions of Other Students	4	3.75	1.26	3.00	2.00	-.750	1.50	-1.00

Note. Rating scale: 6= Very Concerned; 1=Not Concerned.

*p < .010. **p < .001 to .010.

and impact on patient safety) were statistically significant. The amount of change related to “faculty time” provides strong evidence of the positive impact of the training.

The dental faculty’s level of concern decreased for each of the six issues, with the amount of change for two of the concerns being statistically significant (i.e., impact on clinical standards and impact on patient care). The amount of change for two other concerns (i.e., staff time, impact on academic standards) provides strong evidence of the impact of the training.

Finally, the allied health faculty’s level of concern about each of the six concern areas decreased after the training. The greatest amount of change related to “staff time,” while the least related to “cost of accommodations.” The amount of change that occurred pre-post training was statistically significant for four of the concern areas, including patient safety.

Knowledge

Table 3 shows the means of the ratings given by faculty of the four disciplines regarding the extent to which their knowledge of four issues was increased

Table 3

Means and Standard Deviations of Faculty Ratings of Their Knowledge Increase

Topics	Disciplines											
	Medicine			Nursing			Dentistry			Allied Health		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Accomm.	50	4.12	1.206	95	4.66	1.145	46	4.58	1.000	23	5.09	1.041
Legal Issues	49	4.12	1.364	93	4.57	1.338	46	4.95	1.045	22	4.91	1.151
Clinical Teaching	49	3.83	1.240	94	4.52	1.143	46	4.28	1.073	23	4.52	1.410
Classroom Teaching	49	4.03	1.201	94	4.51	1.216	46	4.25	1.233	23	4.83	.984

Note. Rating scale: 6= Knowledge about the topic change a great deal; 1= Not at all.

as a result of participating in the inservice training program. On a scale of 1 (Not at All) to 6 (A Great Deal), only one rating mean was less than 4, which was 3.83 for the medicine faculty about "How to teach students with disabilities in clinical settings." Representatives from four disciplines believed that they had learned the most about accommodation strategies and legal issues.

General Feedback

Table 4 shows the means of the faculty ratings of the extent to which they agreed that they would use the information, the format was conducive to learning the information, and the topics met their needs. All ratings were over 4.0, and all of the ratings given by the nursing, dentistry, and allied health faculty were over 5.0.

Discussion

The field test results of "A Day in the Life of a Health Sciences Student" suggest that the perceptions, concerns, and knowledge of health science faculty can be positively impacted by training. Indeed, the authors were pleasantly surprised by the amount of change that occurred in reported faculty perceptions, concerns, and perceived knowledge as a result of the two-hour inservice program. We might expect that if faculty had attended additional training events the extent of change would have been even greater. This hypothesis was not addressed by this field test, but is worthy of study in the future.

The inservice training curriculum appears to have had its greatest impact on the perceptions of the nurse faculty. This may in part simply be because

Table 4

Mean and Standard Deviations of Faculty Feedback Ratings About the Inservice Training

Questions	Disciplines											
	Medicine			Nursing			Dentistry			Allied Health		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Topics Met My Needs?	50	4.54	1.33	94	5.17	.89	44	5.30	.85	23	5.52	.95
I Will Use Information?	50	4.74	1.41	112	5.37	.90	53	5.34	.83	31	5.45	.93
Format was Conducive to Learning?	51	4.75	1.51	109	5.35	.98	53	5.55	.64	31	5.45	.96

Note. Rating scale: 6 = Strong Agreement with question; 1 = Strong Disagreement.

these faculty's perceptions appear to have been the least positive prior to the training; thus, they had more "room" to improve. Anecdotally, we found throughout our work on this project that nurse faculty had a high level of concern, particularly about patient care, regarding students with disabilities. On the other hand, they were eager to learn and were open to changing their perceptions of these students.

Considering that the medicine faculty's perceptions were quite positive prior to the training (i.e., they had less room to change than the other faculty), we were surprised at the extent to which the training positively impacted their perceptions of students with disabilities. One possible explanation is that the medicine faculty self-selected to attend the trainings,

whereas program administrators in many of the other programs communicated to the faculty that they were expected or even required to attend the trainings. This was never the case for the medicine faculty. Thus, these faculty were likely the most positive about and interested in the issue of medical students with disabilities prior to the training, and perhaps the most open to the further enhancement of their perceptions.

The training program appeared to be the least effective for the dental faculty. Anecdotally, the dental faculty were the "toughest" audience of the four groups. In part, the nature of the dental profession may partly explain the resistance to change regarding their perceptions of students with disabilities. The dental profession is fairly prescriptive and narrow.

Most dentists perform basically the same job and prescribed set of skills, as is also fairly true of hygienists and assistants. For example, all dentists fill cavities. On the other hand, physicians and nurses perform a much wider array of skills and go into a variety of jobs that require very different skills and abilities (e.g., psychiatrist vs. surgeon). Thus, dental faculty members tend to believe that either you can do the precise set of skills required of dentists or you cannot. It appeared that the dental faculty were open to the idea that some people with disabilities could perform the necessary skills of their profession, but that there are many individuals with disabilities who could not be accommodated enough to be able to be a dentist, hygienist, or assistant.

For the purposes of this article we did not attempt to analyze the differences between disability groups. However, there appears to be differences within and across disciplines related to perceptions of students with different disabilities. Prior to the training all of the disciplines had lower perceptions of the ability of students who are blind and those with mental health disabilities. Based on anecdotal reports, it appeared that few of the faculty who participated in the training had knowledge of health sciences professionals who are blind and none had taught such a student. We were able to find and conduct interviews with a number of doctors who are blind, but have not been able to find nurse, dentist or allied health professionals who are blind. However, the videotape of doctors who are blind appeared to impact the perceptions of not only the medicine faculty, but also the nurse and allied health faculty. The videotape had less impact on the dental faculty, likely due to the issues already discussed.

Considering that society continues to stigmatize people with a mental health disability based on fears that they are prone to violence, as well as health science faculty's general concerns about patient safety, it was not surprising that faculty perceptions were fairly negative about students with this disability. In our revised curriculum we have provided more information aimed at helping to dispel myths related to individuals with a mental health disability.

Our conversations with the faculty who participated in the training suggested that one of the most important elements of the training program were the

videotapes of successful health science professionals with disabilities. Seeing highly competent and successful health science doctors, nurses, dentists, and various allied health professionals describe the challenges that they encountered, and the strategies that they and their faculty used to meet these challenges, appeared to be a powerful experience for the faculty and to impact their perceptions of the ability of students with various disabilities to be successful health science education students. In addition, because the professionals directly addressed many of the concerns of the faculty and described specific accommodation strategies that they used in their classroom and clinical settings, the videotapes likely accounted for a substantial amount of the change in the concern and knowledge measures of the study.

Because the existing literature placed so much emphasis on patient safety, it was not surprising that this was a key concern of the faculty across the four disciplines. We were pleased to find that the impact of training on this concern was statistically significant for the nursing and dentistry faculty, and that there was strong evidence of its impact for the allied health faculty. Again, the fact that the medicine faculty's pre-training concern was relatively low perhaps explains the lack of a statistically significant change for them.

The results of this field test substantiate the results of our survey showing that faculty are very concerned about the amount of time it will take them to accommodate and work with students with disabilities (Sowers & Smith, *in preparation*). All faculty members are very busy and have limited time. However, time is a particularly critical issue for many health sciences education faculty who not only teach, but also directly supervise students in clinical settings and carry a patient load. Again, we were pleased to see that the amount of change for this concern was statistically significant for the nursing and allied health faculty, and that there was strong evidence that the amount of change for the dental faculty could be attributed to the training and its focus on illustrating practical accommodation and teaching strategies.

The focus on providing faculty with examples of accommodations that may be used for specific tasks that students must perform in their clinical programs may explain the substantial increase in the perceived knowledge by faculty. In fact, we believe that tailor-

ing the training to the specific and practical demands and requirements of each of the health sciences education disciplines was key to the impact it had on faculty across the knowledge areas addressed on the questionnaire, as well as the perception and concerns questions.

One of the greatest challenges in trying to deliver training to faculty was their time availability. The limited time they have available for training is usually devoted to learning about medical advances (e.g., new drugs and procedures) that they can teach to their students. It is rare for health sciences education faculty to attend training to enhance their teaching skills. In fact, two hours was about the upper limit of what they were able and willing to allocate for our training. We found that we could get the best turnout when we offered the training early in the morning with coffee and bagels, or at lunch with sandwiches. In addition, repeating the training in each program on numerous occasions during the course of the project provided faculty many opportunities to fit it into their schedules.

In addition to the full two-hour inservice training curriculum, we used a wide array of other strategies to bring information about students with disabilities to faculty. For example, we offered to deliver abbreviated versions (one hour and even less) of the curriculum to faculty as part of their departmental meetings and in other venues. We also cosponsored a one-hour lunchtime lecture series with the office of diversity and multicultural affairs that was attended by over 500 administrators, faculty, staff and students from OHSU. Nationally known experts in the area of cultural, sexual orientation and disability presented at these forums. For example, the dean at a school of medicine that has progressive policies related to students with disabilities and a student with significant physical disabilities were the featured speakers at one of the forums. As suggested earlier, the web site was also a key tool for getting information to faculty at OHSU and PCC and the other schools where the training was field-tested. We also mailed newsletters to each faculty member at OHSU and in PCC's health sciences programs, which included information about Universal Design strategies and about how to teach and accommodate students with disabilities, as well as information about the web site. In addition, we left stacks of these newsletters in key locations around

the university and college, including the cafeteria and faculty lounges.

The number of students with disabilities who wish to enter the health sciences fields and who apply to health sciences education programs appears to be growing (Keyes, 1993; Maheady, 1995). As a result, these programs and their institutions are likely to become increasingly interested in receiving training and technical assistance. In addition, the contingencies on these programs to attract more diverse students are growing. There is a critical nursing shortage in the country, which is motivating nursing programs to proactively reach out to students who have traditionally been underrepresented in the field (Marks, 2000; Smith & Sowers, 2002; Tanner, *in press*). In addition, health science educators understand that they need to create a more diverse professional workforce in order to reflect the increasing diversity of the patient population in America. Hopefully, health sciences programs will continue to grow in understanding that people with disabilities can help meet their workforce needs and bring a diverse perspective to their programs and professions.

Limitations

As suggested earlier, many of the faculty who participated in this training did so because they were interested in learning about issues related to teaching and accommodating students with disabilities. This was particularly true for the medicine faculty. It is unclear what the extent of change would have been if an even larger percentage of faculty had attended who were not self-motivated. It would have been helpful to include a question in the training evaluation questionnaire to assess motivation for coming to the training (e.g., interest, expectation, requirement, food).

Perhaps the most important limitation of the study is the fact that we were only able to collect self-report data about faculty's attitudes, concerns, and knowledge. We did not collect data that revealed the extent to which the behavior of the faculty actually changed as a result of participating in the training. Research is recommended that evaluates the extent to which this or other inservice training programs impacts admission decisions for students with disabilities, as well as how the faculty in these programs teach and accommodate these students.

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